

REPORT

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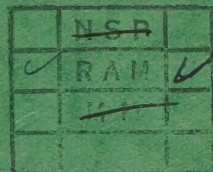
DEPARTMENT OF AGRICULTURE

1956



SIERRA LEONE

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TABLE OF CONTENTS

PART I—POLICY AND GENERAL SUMMARY	<i>Page</i> 1
<i>A</i> —THE PROVISION OF ADEQUATE FOOD FOR THE PEOPLE ..	1
<i>B</i> —THE CULTIVATION OF CASH AND EXPORT CROPS ..	4
<i>C</i> —SOIL CONSERVATION	6
<i>D</i> —THE QUALITY OF AGRICULTURAL PRODUCE ..	6
<i>E</i> —STAFF TRAINING AND AGRICULTURAL EDUCATION ..	7
<i>F</i> —RESEARCH	7
<i>G</i> —GENERAL	8
PART II—THE WORK OF THE DEPARTMENT OF AGRICULTURE	
<i>A</i> —ORGANISATION AND STAFF .. .	9
<i>B</i> —AGRICULTURAL STATIONS .. .	10
<i>C</i> —HORTICULTURAL SECTION .. .	12
<i>D</i> —EXTENSION WORK .. .	14
<i>E</i> —RESEARCH	
Plant Pathology Section .. .	22
Systematic Botany Section .. .	23
Entomology Section .. .	23
Agricultural Chemistry Section .. .	24
<i>F</i> —NJALA TRAINING COLLEGE .. .	25
APPENDICES	
I—EXPORTS OF PRINCIPAL AGRICULTURAL PRODUCTS ..	27
II—RAINFALL .. .	28
III—RESULTS OF TRIALS AND EXPERIMENTS, NJALA ..	29
IV—LOCAL WEIGHTS AND MEASURES .. .	31

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REPORT OF THE DEPARTMENT OF AGRICULTURE FOR THE YEAR 1956

PART I—POLICY AND GENERAL SUMMARY

The policy of the Agricultural Department is:—

- (a) to ensure an adequate supply of essential foodstuffs for the people;
- (b) (i) to improve agricultural methods for producing food crops and suitable cash and export crops; and to raise and distribute better types of such crops, so that the producer will get a better return for his labour and enjoy a higher standard of living;
(ii) to improve the local livestock and to evolve and foster improved systems of animal husbandry;
- (c) to conserve the soil and to maintain and improve its fertility by the encouragement of optimum land use practices;
- (d) to improve the quality of agricultural produce, whether for local consumption or export;
- (e) to provide for the training of the staff required to implement the Department's policy;
- (f) (i) to acquire, through investigation and research, the local knowledge necessary for the improvement of agriculture; to work out the practical application of this knowledge, and to make the results available to the community by means of propaganda, demonstration and practical assistance;
(ii) to control diseases and pests of economic plants;
- (g) to ensure the proper co-ordination of agricultural developments by collaborating with the other departments and agencies concerned.

A—THE PROVISION OF ADEQUATE FOOD FOR THE PEOPLE

2. *Rice*.—This is the main staple food throughout the country and is a crop, therefore, which has always received very considerable attention. At one time Sierra Leone was self sufficient and even exported rice. In recent years, however, because of increased local consumption, better standards of living and the diamond rush, it has been forced to import a considerable proportion of its requirements. The influx of large numbers of strangers to the diamond workings has not only created a bigger demand, but has also, with affluence, led to increasing individual consumption. Although many strangers are now leaving, many of the other workers who have been attracted to the workings are erstwhile potential local farmers.

3. Earlier schemes to increase production were designed to utilise mangrove and other swamp lands, which had hitherto been unavailable to farmers; to this purpose loan and other assistance was provided by the Department and more recently by District Councils. This development was in fact one way in which the long established departmental policy of encouraging the use of more fertile swamps rather than of the more easily eroded uplands was implemented.

4. Most of these schemes were comparatively small and have proved themselves, more particularly in areas where uplands are in short supply; the majority of them have therefore now ceased to function, and the follow up has been left to individual farmer enterprise.

5. Since 1949 a more ambitious programme has been introduced which places the emphasis on the use of mechanised equipment for contract ploughing in the swamps. This work, which was pioneered by the Department, has continued to be a major function of its annual activity. This year, however, a further policy development has been instituted, whereby the Department will gradually hand over areas to rice producer co-operatives, once they are firmly established, and for which the co-operatives themselves will thereafter be entirely responsible. The Department's staff and equipment will thus be released to move on to open up equivalent areas of new land elsewhere.

6. To initiate this new policy this season the first three Rice Producer Co-operatives at Gbundapi, Torma Bum and Massimo, which had obtained light Ferguson tractors, carried out harrowing for their members following the Department's ploughing. Under the aegis of the Co-operative Department these three groups will now become completely responsible for 3,000 acres next year.

7. The Agricultural Department's annual target acreage has been fixed at 12,000 and for the first time this was achieved this year. The gradual expansion of this scheme, which has been no simple achievement, is well illustrated in the following table:—

<i>District</i>		<i>Acres Ploughed</i>							
		1949	1950	1951	1952	1953	1954	1955	1956
Southern Circle		4	69	282	465	1,178	2,278	4,073	5,530
North-western Circle	..	—	—	80	645	683	757	1,014	2,008
South-western Circle	..	—	—	32	719	1,018	1,012	1,173	1,484
Northern Circle	..	—	—	—	238	915	2,449	3,600	2,819
North-eastern Circle	..	—	—	—	30	163	127	141	} 250
Colony	..	—	—	—	—	—	4	65	
Total	..	4	69	394	2,097	3,957	6,627	10,066	12,091

8. Mechanical cultivation is being carried out primarily on the grasslands near the mouths of the Bonthe and Pujehun river systems, on the middle reaches of the Scarcies, and on the inland swamps, known in the Makeni area as "bolis". On the latter, yields tend to be lower than on the more fertile river banks of the grasslands, but responses to superphosphate have been shown to be worthwhile and help greatly to improve yields.

9. Generally in 1956 yields have been reasonably good; in the Scarcies a record crop is in prospect, and in the Bonthe-Pujehun area, whilst the higher river bank crops suffered from a lack of August rains, the lower lands conversely yielded better than usual because they were not subject to excess flooding.

10. Although the gap between local rice requirements and production still remains less than half filled (imports in 1956 totalling 36,800 tons worth £1,650,442), it can be fairly asserted that mechanical cultivation is both leading to a higher output per farmer, and also to a greater utilisation of the swamp lands to the advantage of the uplands. It is equally plain that

increasing quantities of rice are becoming available from areas which heretofore produced little, even for local consumption. The trend away from the uplands is exemplified by the following figures of farm acreages in the South-western Circle:—

	1952		1953		1954		1955		1956	
	No. of farmers	Acres	No. of farmers	Acres	No. of farmers	Acres	No. of farmers	Acres	No. of farmers	Acres
Inland swamps	5,459	4,885	6,093	5,241	6,574	7,764	9,328	7,805	10,138	9,943
Mech. Cult. Schemes	108	719	111	1,028	112	1,012	184	1,121	266	1,479
Upland farms	—	51,166	—	39,234	—	77,814	20,779	41,782	18,738	40,736

11. Whilst mechanical cultivation has been shown to be practicable in certain areas, it must be concentrated within such areas if the greatest economic efficiency and servicing are to be possible. Additionally, there remain a number of problems, such as weed growth, particularly in the boli lands, which will have to be resolved before it can become permanently and successfully integrated with local farming systems; it is, however, still questionable as to whether it can yet be really economic without subsidy assistance.

12. Increased rice yields are also being encouraged by the provision of fertilisers through the Department; these are sold at a Government subsidised price at one-third cost to primary food producers. More and more farmers are realising the value of using fertilizers, and sales totalled nearly 200 tons, compared to 112 tons last year.

13. The West African Rice Research Station at Rokupr also continues to play a very important part towards improved production, not only through testing and producing new and better varieties of seed, but also through the work being done on the problems of mangrove soil utilization. As the station now produces a separate report details of its work are not included here.

14. *Other Food Crops.*—Vegetable production, particularly in the Colony and Kabala areas is being encouraged by the Horticulturist who assists market gardeners with seed and fertiliser supplies in addition to advisory visits. He also propagates and supplies fruit trees, for which there continues to be a steady demand. In all areas, cassava remains the second most important locally grown food crop, and its cultivation through tree crops on the uplands is being encouraged. Groundnuts, which have been exported in the past on a small scale, were this year all used locally for food and oil; lower prices also resulted in a somewhat reduced acreage. Experimental work continues at Njala as regards fertiliser responses for this crop, but the cultivation trials in the *Lophira* bush areas have been discontinued, because results have been conclusively disappointing.

15. *Livestock—Cattle.*—At Musaia Stockfarm in the Koinadugu District long-term selection and breeding work continues with the primary objective of establishing an early maturing beef strain of Ndama.

16. It has to be recorded with regret that, because of the lack of funds the two District Council Cattle Fattening Schemes, at Pujehun and Moyamba, which had both started so propitiously, have had to cease operation.

17. On the other hand, however, the Cattle Owner Settlement Scheme in the Koinadugu District continues successfully, and, despite some friction owing to delays in the payment of rent, this scheme is proving it's worth quietly and unspectacularly. Twenty-nine Fulahs, who were previously nomadic, have now been settled in individual holdings each of one square

mile and there are numerous others waiting for holdings to be demarcated and allocated. Although its principal objectives are for settlement and erosion control, this scheme should ultimately lead to increased beef production locally.

18. Meanwhile, however, local meat supplies continued largely to come from French territory on the hoof with a large proportion diverting to the diamond areas.

19. *Pigs*.—Newton and Njala continued to be the main breeding stations, but the demand for stock has on the whole been disappointing; production at Musaia has now been discontinued because, in this predominantly Muslim area, there has been no demand at all. Nevertheless, the supplies of pork for local producers in the Colony area has grown sufficiently to satisfy demand. In all, eighty-four head were sold for breeding and 185 for slaughter from Agricultural stations during the year.

20. *Rabbits*.—Continue to be in popular demand, and more and more people are keeping these as a backyard food supply; 122 were sold for breeding.

21. *Poultry*.—Imports of day-old chicks from the United Kingdom have been continued, and the demand for stock from Newton and Njala is still heavy; most farmers, unfortunately, still prefer to wait until birds are mature before purchase, rather than to undertake rearing for themselves. 5,298 hen's eggs were sold for hatching and 39,976 for table purposes from Newton, as well as 2,238 birds for breeding. 173 ducks were sold for breeding and 669 duck eggs for hatching; 55 Chinese geese were sold for breeding. For both of the latter the demand continues to exceed supply.

B—THE CULTIVATION OF CASH AND EXPORT CROPS

22. Appendix I sets out the comparative figures for agricultural exports in recent years, according to the latest information available.

23. *Cacao*.—The principal changes of importance are:—the increased cacao export, the highest on record, which, however, because of falling world prices, was actually worth very much less than last year. Interest in cacao, although still active, is therefore less than for other crops such as coffee, for which prices have continued to be favourable, and little new planting is taking place.

24. The Department has continued actively to advise farmers with regard to maintaining standards of quality and methods of fermentation; export quality reports continue to be satisfactory.

25. Spraying trials for the control of Black Pod Disease have been continued at Puabu in the Kenema District, where the Department is now selecting a site for a new Cacao-Coffee Development Station. In due course the recent Amazonian importations from the West African Cocoa Research Institute will be planted there for trial and multiplication.

26. Despite the fall in the world price the Produce Marketing Board has continued to pay an additional subsidy and producers received the equivalent of £186 13s. 0d. per ton Grade I and £168 for Grade II and £130 for Grade III; with the majority of the crop making Grade I, the overall price paid averaged £180.

27. Farmers would do well to continue a lively interest in this crop which can help to diversify their economy, rather than to place too much faith in one crop, such as coffee, which enjoys perhaps only a temporary price advantage.

28. Apart from Black Pod Disease, monkeys continue to be the most serious pest of this crop, and, unfortunately, local organisations appear to have lost the initiative they had to tackle them through concerted campaigns.

29. *Coffee*.—Exports have continued to rise and like cocoa were a record; comparatively large new plantings continue to be made. Production has shown a remarkable and rapid advance since the war, prior to which exports were comparatively insignificant. Quality appears to have been reasonably good, and the new produce grading regulations are improving the cleanliness of the product.

30. The Department continues to advise farmers both to take more care in harvesting and to improve plantation cleanliness; nonetheless it is still unfortunately common practice for the trees to be stripped before the majority of cherries are mature; the shortage of available labour at harvest time is probably responsible for this, rather than ignorance. Farm cleanliness could still show improvement, but generally, coffee receives more attention than other tree crops, because at least for the present—it pays well. Seedlings have been in very heavy demand in all areas from departmental and District Council nurseries.

31. *Palm kernels*.—Although exports remained at the same level as in 1955, there is no sign of any welcome upsurge in this commodity. With many of the younger men away after diamonds, less fruit is harvested and generally oil-palms are neglected; whilst low prices tend to discourage interest, it also remains difficult for the farmer to consider oil-palms as a true crop because they occur wild in such profusion; he has yet to learn that improved varieties will, by contrast, amply repay care and attention.

32. Many thousands of seedlings continue annually to be distributed from nurseries, but survival rates are most disappointing. This is due in part to distribution difficulties, many District Councils having lacked the transport or the funds to assist; it is also aggravated by the enforced distribution of bare rooted plants.

33. Demonstration plots laid down in several areas by the West African Institute for Oil-palm Research substation, in conjunction with the Department, have abundantly demonstrated the advantage of the better ball of earth technique for transplants and also of the need for early planting.

34. Until such time as nurseries are more widely dispersed, and distribution and maintenance difficulties can be overcome, losses will unfortunately be liable to continue.

35. Another cause of field loss is the damage caused to seedlings by the “cutting grass” (*Thryonomus swinderianus*); the most effective deterrent to this pest is the use of protective wire netting “collars”, which have been demonstrated on a number of field plantation plots.

36. *Palm oil* has now become a nett import, and with the considerable demand and high prices ruling in the mining areas, local producers have found it more profitable to prepare it themselves and sell oil locally, rather than to bring fruit into the Marketing Board’s Pioneer Mills; as a result the mills are continuing to run at a loss and to be operating for only very short periods each year.

37. *Ginger* production has declined as a result of unfavourable prices, and *pepper* exports almost disappeared this year because of the Chiefdom disturbances in the main production area.

38. *Piassava* with better prices offered, has shown an increase but like ginger would benefit inestimably if stable prices could be assured. For a crop which requires very laborious processing it is not surprising that producers are trying to find more rapid processing methods for themselves; the Department also is therefore carrying out experiments to check whether these are likely to be injurious to the quality of the fibre.

39. *Bananas and Benniseed* have both shown sharp declines, the former because of shipping difficulties, and the latter as a result of falling prices.

40. The increased value of exports of *Calabar beans* is of interest, as this is harvested from the wild state.

C—SOIL CONSERVATION

41. It is perhaps not over-rash to claim that Sierra Leone is fortunate in having no spectacular soil erosion to give concern; yet there are many areas of uplands which have been degraded by burning and by over grazing, and, in the Colony and in the hillier lands of the North and East, sheet and gully erosion are apparent.

42. The Department continues to join with the Forestry Department in advising a policy of early burning; in many areas this has now become a general and welcome practice, and there is visible evidence that natural regeneration is encouraged as a result.

43. Equally, as already mentioned, the Department's policy of encouraging swamp cultivation as opposed to annual cropping on the uplands has had, and continues to have, an important effect on decreasing the risks of serious soil erosion.

44. More specifically, however, two departmental schemes are in progress which are designed directly as soil conservation measures; these are: (i) the assistance given to farmers in the hill areas of the Colony for stone bench terracing, and (ii) the Cattle Owner Settlement Scheme in Koinadugu District. The latter—already referred to—is sited in one of the main watershed areas of the country. It is primarily a soil conservation measure, and by restricting overgrazing, it has encouraged the regeneration of the natural vegetative tree cover.

45. In general, whilst there are no grounds for complacency therefore, and there is an ever-pressing need for the community to become more and more erosion conscious, there is considered to be no necessity at present for elaborate and expensive conservation schemes; nor need there ever be provided sensible farming practices prevail.

D—THE QUALITY OF AGRICULTURAL PRODUCE

46. In the main coffee and cocoa growing areas of the south-east and south-west circles, departmental staff continue to devote a considerable proportion of their time to advising farmers regarding the best methods of preparing produce. In the Bonthe area also their work includes advice on piassava preparation, and in the Bo and Moyamba districts, on the preparation of ginger.

47. The work of the Rice Research Station, and the District Seed Distribution Schemes are directed to the production of higher yielding and more acceptable rice varieties; and at agricultural and horticultural stations, the testing and multiplying of new and better crop varieties for subsequent distribution to producers continues.

48. The quality of produce for export is of paramount importance in these days of fluctuating world prices, and it is particularly vital to Sierra Leone, as regards coffee and cocoa.

49. Farmers are therefore advised to pay careful attention to the attainment of uniformity and to following the processing and grading instructions offered by the Agricultural and Produce departments; in this respect also, producer and marketing co-operative societies can play an important part.

E—STAFF TRAINING AND AGRICULTURAL EDUCATION

50. The Njala Training College continues to train Agricultural Instructors for the department; nine completed their course during the year and were posted to the field. Thirty-three were in training in their first and second years, including two for the local West African Institute for Oil Palm Research Substation, and two others from the Gambia.

51. A short refresher course, the first of its kind, was held in August for Agricultural Instructors who have been in the field for some years.

52. Mr. W. C. O. Allen, Agricultural Instructor, continued on secondment to Mabang Agricultural Academy; he is now likely to be released early in 1957.

53. Mr. A. R. Siafa, having completed one year's post-graduate training at Reading University, moved on for his final year at the Imperial College of Tropical Agriculture, Trinidad. Mr. H. D. Jarrett also entered his final two years as a post-graduate at London University, where he is specialising in Chemistry.

54. Mr. S. A. Kawa, having completed his degree course at Wye, commenced his first year's post-graduate course at Cambridge. Messrs. S. A. Jabati and M. B. Alpha continued their degree courses at Reading.

55. Messrs. J. O. Palmer Davies, W. E. A. French and N. A. Taylor attended Seale Hayne to study for the C.D.A.

56. Whilst it is unfortunate that the number of qualified candidates coming forward for scholarship training remains low, it is refreshing to hear that of those who are undergoing training, many are earning a particularly good reputation. It is, however, reported that students of the Agricultural Instructor grade are handicapped by their insufficient grounding in science subjects; until this can be remedied, the reservoir of candidates is unlikely to increase as fast as is required.

F—RESEARCH

57. The West African Rice Research Station now publishes a separate report; the Director continues to be responsible on behalf of the Sierra Leone Government for the overall administration of the Station's work.

58. The West African Institute for Oil Palm Research (Benin) has maintained and expanded its substation in Sierra Leone, which is now in the charge of Mr. E. B. May. Although entirely separate from the department of Agriculture, the two agencies work in close co-operation, particularly so because the substation is sited at Njala.

59. The work of the Departmental Research Staff—Agricultural Chemist and Plant Pathologist—is covered in Part II of this report. The former has been continuing investigations on fertilisers, particularly with rice and groundnuts, and on trace elements, together with routine soil and feeding stuff analyses. The Plant Pathologist has been particularly concerned with cocoa spraying trials against Black Pod Disease.

60. Although the need for research leading to immediate practical advice to farmers is often widely appreciated, the equally important function of an Agricultural Department to cover longer-term research in the interests of the country's future is not always recognised so fully. Of recent years with few specialists in post, less work of this kind has been possible than is desirable, although the immense value of the work carried out by Mr. F. C. Deighton, lately Plant Pathologist, cannot be too highly stressed; the publication during the year of his manual "Diseases of Cultivated and other Economic Plants in Sierra Leone" and the preparation of his "Check list of the Flora of Sierra Leone with vernacular names", the result of many years work, call for special mention.

G—GENERAL

61. Although the Protectorate disturbances had some effect on agriculture and on the acreage which could be ploughed mechanically particularly in the north-west, they did not prevent the department's staff from being able to carry out their routine duties everywhere.

62. Undoubtedly the diamond "rush" also affected the general agricultural pattern both through increased demand for food crop production, and by the irresistible attraction it offered to the younger men to desert farming. Nonetheless, there are localities where farmers proudly maintain that their rice is to them more valuable than diamonds, and it would be unfair to imply that farming has suffered by comparison to more than a limited extent. There is, certainly as yet, no diminution in the demand for mechanical ploughing, and the coffee acreages in particular, continue to expand.

63. It is unfortunate that District Councils generally have been unable to devote as much finance to agricultural projects as before, and the extension work, plant nursery and distribution services have consequently suffered.

64. This trend has been further aggravated by the Produce Marketing Board's new policy of reducing their assistance grants for these purposes; this policy is the consequence of the diversion of a proportion of the Board's reserves to wider development schemes.

65. In summarising a year's weather it is seldom possible to say that it has been normal, or that the rainfall distribution has been average; 1956 was no exception, with a drier than usual wet season, yet in the outcome, crops in all areas can be regarded as being very satisfactory. (Rainfall figures are given in Appendix II).

66. The Department has lost and gained staff, and on balance is about as well off as before, although serious shortages are still apparent, particularly on the clerical side.

67. The Department has continued to co-ordinate its work wherever possible with other departments particularly with Co-operative, Produce and Veterinary, whose co-operation is gratefully acknowledged.

68. On inter-territorial matters, the Acting Director attended the first meeting of the West African Standing Advisory Committee for Agricultural Research in Accra in April and with the Principal Agricultural Officer, West African Rice Research Station, went on to a research meeting in Ibadan in Nigeria. Advisory visits were also paid by Messrs. Craufurd and Jordan of the West African Rice Research Station to Nigeria and the Gambia respectively.

69. The Director continued to serve as an *ex-officio* member of the Legislative Council, and to be a nominated member of the Produce Marketing Board.

70. During the year a number of new Colonial Development and Welfare applications for grants were completed, which included one to cover the appointment of an Economic Botanist/Ecologist (R811), and another for short-term soil survey investigations in the boli lands employing a soil chemist (D3094).

71. Two other schemes specifically for the north are D3062 for the expansion of the Animal Husbandry Station at Musaia, and D3032 for the Cattle Owner Settlement Scheme.

72. D3055 covers the capital costs of establishing a Cocoa/Coffee Development Station in the Kenema area, and D3166 the capital costs of a Water Development Scheme which aims to increase the area of potential rice lands in the Scarcies.

73. It is to be regretted, however, that the degree of participation by West African Governments and Colonial Development and Welfare in the financing of the Rice Research Station was still undecided at the year's end, when the old scheme was due to expire.

J. W. D. GOODBAN,
Director of Agriculture.

31st August, 1957.

PART II—THE WORK OF THE DEPARTMENT OF AGRICULTURE

A—ORGANISATION AND STAFF

74. The amalgamation of the Scarcies and Port Loko Circles, carried out in November, was the only major organisational change. As a result, the Circle work is now wholly under the supervision of the Agricultural Officer, Port Loko, and the Principal Agricultural Officer in charge at Rokupr is able to devote his full time to the work of the expanding Rice Research Station. As from 1st January, 1957 it is proposed that the title of the latter post shall become that of Officer-in-charge.

75. The retirement of Mr. T. N. Greeves, Director of Agriculture, on medical grounds in July, is recorded with regret. This loss, only sixteen months after his appointment, was most unexpected.

76. Mr. T. S. Jones, Deputy Director, acted as Director until Mr. J. W. D. Goodban, O.B.E., arrived on transfer from British Honduras early in December.

77. There were inevitably a number of other senior staff changes during the year:—Messrs. P. Adames, Principal Agricultural Officer, and J. D. A. Harris, Agricultural Officer, left on transfer and promotion to Western Nigeria in October and July respectively. Mr. A. S. Macdonald, Agricultural Officer, left on transfer to Uganda in October, and Messrs. E. C. W. Dunham and F. P. Massey, Agricultural Officers on probation, resigned in August and September respectively.

78. Dr. T. E. Tomlinson, Soil Chemist at the Rice Research Station, resigned in December.

79. New appointments included:—Mr. R. A. Kitching, M.B.E., who arrived from the Gambia in January as Senior Agricultural Officer; Messrs. R. F. A. Murfitt, B. R. Shaw, H. E. G. Morgan, R. L. Morris, R. C. Knill and R. I. McQuistan, newly appointed Agricultural Officers, arrived in August.

80. Dr. M. G. R. Hart arrived in January to fill the post of Soil Chemist (Microbiologist) at the Rice Research Station, and Messrs. C. R. Elliott and J. H. Kearns as Temporary Agricultural Superintendents (Mechanical) for Torma and Katonga.

81. Despite these new appointments, a number of vacancies remained at the end of the year both in the Senior and Junior Services; in the latter, the clerical establishment was particularly short.

B—AGRICULTURAL STATIONS

82. The Department now operates three principal agricultural stations at Njala (Moyamba District), Newton (Colony) and Musaia (Koinadugu District); the last being primarily a cattle husbandry stock farm.

83. Additionally, the department retains a small area at Makeni, and is responsible for supervising the work on a number of District Council farms and nurseries scattered throughout the country.

84. The Director is also responsible for the general supervision of the activities of the Rice Research Station at Rokupr.

Experimental Station, Njala:

85. At Njala experiments were continued with groundnut cultivation and fertilisers trials and on continuous cropping with yams and leguminous cover crop trials, and with mixed cropping. Fruit tree recording was continued and local plant distribution from the nurseries totalled:—oil palms—2,360, Robusta coffee seedlings—22,700 and coconuts—382. Six hundred and thirty-five F3 Amazonian cocoa seedlings have been raised in pots from seed received from the West African Cocoa Research Institute in 1955, and a further batch received late in the year has also been planted. These will, in due course, be established at the new Cocoa/Coffee Development Station to be started in 1957 near Kenema. The central germinator at Njala was also used for all E.W.S. oil palm seed received from the West African Institute for Oil Palm Research, and germinated seed and seedlings were supplied thence to circles.

86. In the livestock section only a few cattle have been maintained as muck makers; they suffered from a shortage of fodder in the dry season, and two deaths occurred in July when the possible poisoning effects of the immature fruit of *Gmelina arborea* were suspected. The pigs have remained healthy, but the main demand is unfortunately more for slaughter animals than for breeders; only four of the latter were sold, in contrast to seventy-four for slaughter. Poultry egg production totalled 5,468, of which 489 were incubated, and 397 sold for hatching; 78 young birds were sold. Muscovy ducks hatched 95, of which 13 were sold for breeding; 87 birds were sold for table use. Fertility continued to be low amongst the Chinese geese, and although the demand for breeders was high, only three pairs could be sold. Seven pairs of rabbits were sold for breeding and 33 were born; 2 Chinchilla and 2 Flemish Giant bucks were imported from the United Kingdom in an effort to try and increase litter size.

87. Details of the crop experiments and trials are recorded in Appendix III.

Experimental Station, Newton:

88. The station at Newton is representative of a large part of the Colony area, the soil of which is poor, sandy and generally overworked; the chief vegetation consists of grass, low bush and oil palms. Poor farming has reduced yields to a minimum, and therefore all developments are

directed to increasing production by improved farming methods. This is being achieved by rotations and intercropping, by mechanical cultivation and by the use of compost, farm yard manure and artificial fertilizers.

89. Intensive valley cultivation is also being demonstrated, including the use of dams and gravity irrigation. Additionally, stock farming has been designed to fit into the policy of soil conservation and maximum land use, and a model holding is operated to exemplify this on the small farmer's basis.

90. The station therefore also maintains cattle as muck makers; pigs through a breeding unit for sale to local producers, and a separate commercial unit to demonstrate the economics of this type of farming; and poultry for breeding purposes and supply to local producers.

91. *Pigs*.—The pig herd consists of Large Whites and Wessex Saddlebacks; for the first six months of the year health was good, but subsequently troubles arose from a suspected outbreak of Trypanosomiasis. Accordingly, animals were changed over to three feeds a day instead of two, and the routine inoculation at four monthly intervals superseded by immediate injections of Antrycide Methyl Sulphate, followed by Penicillin on the appearance of symptoms. This had the effect of reducing immediate deaths, but sick animals slowly became emaciated and continued to die after six to eight weeks.

92. One case exhibited signs of chronic Swine Erysipelas and the Veterinary Department are therefore now investigating the possibilities of this disease being the cause of death rather than Trypanosomiasis. It is perhaps significant in this respect that most of the blood slides sent to Teko were negative for trypanosomes. The situation is causing concern in that twenty-four deaths occurred in the last half of the year.

93. Despite this, however, the financial turn-over in both breeding and commercial herds was higher than in any preceding year, totalling £2,142 for sales; in all eighty pigs were sold. The profit on the commercial piggery rose from £416 to £586. Litter averages again rose slightly to 8.9 (large White) and 8.7 (Wessex).

94. *Poultry*.—Owing to the reconstruction of the incubator house, production was slightly restricted compared to 1955; nonetheless a total of 2,050 birds were sold, consisting of 307 cockerels, 1,397 growers and 346 day-olds; 4,900 hatching eggs were sold locally, as well as 40,000 for table use. Total egg production increased to 59,000 compared to 48,500 in the previous year. The new system of rearing chicks in raised runs to prevent worm and coccidial infection has proved very successful.

95. Ducks have continued to do well and 669 eggs, 160 birds for breeding and 38 for table use were sold; the Chinese geese have now been confined to runs, but their fertility has continued to be low; 49 were sold.

96. *Rabbits*.—The demand for rabbits also continues to be high, 158 being sold for breeding purposes locally.

97. *Model Holding*.—This has been worked by a local farmer, his wife and son for the last four years, and demonstrates efficient farming and land use in a small irrigated valley. Unfortunately the son has now left and the farmer, as an old man, cannot do all the work himself; he has had, therefore, to bring in two nephews. The family consumed food crops and sold off the surplus and other crops and stock for cash, realising a nett profit of some £16 over expenditure. It is plain that such holdings can only pay their way if they can depend on family labour.

98. *Tree Crops*.—A demonstration of oil palm planting techniques was laid down in conjunction with the West African Institute for Oil Palm Research sub-station, Njala; it proved most impressive in illustrating to farmers the advantages of “ball of earth” as opposed to “bare root”, and early as opposed to late season planting. Other crops including avocado pears and citrus were maintained in the mixed fruit plantations.

99. *Annual Crops*.—Cassava yields were satisfactory at 10,804 lb. per acre; and the rotational cropping of the degraded upland with yams, pigeon pea, cassava, maize, Waterloo beans, *Stylosanthes gracilis* and *Pennisetum setosum* continued. Although the yield of Chinese yams had fallen to 2,633 lb. in 1955, there was a much better crop this year, averaging 11,408 lb. per acre.

Animal Husbandry Station, Musaia:

100. *Cattle*.—The policy continues to be directed to the production of an earlier maturing beef strain of Ndama; strict culling for more desirable conformation characteristics is therefore being continued. Forty-six calves were born compared to fifty-seven in 1955, but the average birth weight rose from 35.5 lb. to 38 lb. with the larger percentage coming from mature stock.

101. Health was generally good throughout the year, only one abortion being recorded, and some foot rot, with tick and fly troubles in the second quarter. Losses totalled 8 head, including 2 calves killed by a python.

102. *Maintenance*.—Continuous attention is having to be given to fencing owing to breakages of old wire, and very considerable replacements are necessary, if breeding programmes are to be safeguarded.

103. Observation plots of twelve grasses have been laid down, of which the following appeared to be the most promising:—

Dwarf guinea grass, *Panicum maximum* strains 8,357 and 8,387; *Andropogon tectorum*, *Setaria kasungula*, *Pennisetum setosum* and *Brachiaria mutica*; these will now be multiplied up for grazing trials.

104. *Pigs and Poultry*.—Because of the lack of local demand for pigs, the maintenance of a breeding herd at Musaia has been discontinued and the balance of stock has been transferred to Newton. Poultry feeding troubles were greatly improved but chick mortality continued high, and an outbreak of fowl pox in December was extremely damaging.

105. *Sheep*.—A small herd of local sheep, numbering 20 head has been brought in for upgrading trials with two rams imported from the Gold Coast.

106. *Crops*.—Rice trials continued, with transplanting giving good yields; six Asiatic varieties from Rokupr appear promising but a superphosphate trial had to be abandoned because of poor growth owing to the late flooding.

C—HORTICULTURAL SECTION

107. The horticultural section, as in past years, gave advice and assistance to growers of fruit and vegetable crops. The emphasis in extension work was laid on the improvement of quality of produce, apart from mere quantity, by the adoption of sound methods of cultivation and new techniques in pest control. In addition, seeds, fertilisers and planting material were made available to the public, and the testing of new varieties of vegetables and fruit continued.

108. A further increase in the number of growers was noted especially round Freetown, and many Protectorate farmers showed an encouraging interest in horticultural work. The quantity of planting material supplied

was slightly less than in 1956. Sales of fertilisers, on the other hand increased noticeably during the year, and they are obviously becoming popular with producers of both farm and garden crops.

109. *New England Horticultural Station*.—At New England, the headquarters of the section, the system of permanent terraces was extended. The plant houses were improved and repaired, and "Trickle" irrigation equipment installed. This system enables liquid fertilisers to be injected into the main water supply.

110. *Lumley Horticultural Substation*.—The production of fruit trees, particularly budded citrus, continued to be the main function of the station. A large number of pineapple plants were also produced from disc cuttings. In addition, trials of new varieties of vegetables continued, and a useful crop of rice was grown on the dry season vegetable garden between May and November. The plant house was completed.

111. *Regent Nursery*.—General improvements were made to the layout of the station and the number of fruit trees raised was increased. Testing of vegetable varieties continued, and seed was collected from suitable types. Advisory visits were made to the Mountain villages, and seeds, fertilisers and insecticides were available for sale to the public from this station.

112. *Kabala Horticultural Substation*.—This station was further developed as a demonstration and advisory centre for the Northern Province. Contour terracing was begun in both the vegetable garden and fruit section and the irrigation system extended. Fruit trees not well represented in the area were obtained from Lumley to be a future source of budding and planting material and many sour orange stocks were grown. In addition, considerable numbers of other plants were grown from seed or cuttings for distribution. Local growers were enabled to purchase seed, fertilisers and insecticides from the station, and were given help and advice by the staff. Vegetable seed production continued on a considerable scale and several new varieties were tested, some of which appear to be promising. Efforts were made to encourage growers to produce more non-perishable crops such as cabbage, onions, corn, beans and carrots, which will withstand road transport over long distances, though work with tomatoes and other vegetables was not neglected. Experimental consignments of vegetables were sent to Freetown and Makeni, to determine suitable methods of packing.

113. *Distribution of Planting Material*.—The demand for planting material was almost as high as in previous years, though fewer plants were distributed. 3,547 economic plants were distributed compared with 4,244 in 1956, and 6,916 ornamentals compared with 6,760. These figures do not include cuttings, of which a large number were distributed.

114. *Distribution of vegetable seeds* continued, particularly to gardeners and schools up country who cannot buy from local retailers. In all, over 13,000 packets of seed were distributed during the year.

115. *Plant Introductions*.—Numerous introductions were made from various sources, and included both economic and ornamental plants.

116. *Experimental Work*.—Trials on the control of "Bacterial Wilt" in tomatoes continued, and specimens of soil were sent to Rothamsted Experimental Station for examination of eel worm populations. The selection of tolerant or resistant varieties now appears to be the most useful channel of investigation, and an experiment was laid down to test the performance of different varieties, using soil deliberately infected with the causal organisms.

117. Nine varieties of carrot were introduced from the United States of America and tested for performance at both Lumley and Kabala, against varieties imported in earlier years. The best varieties of carrot for local conditions appear to be "Tendersweet", "Large Yellow Belgian," and "Chantenay"; "Danvers Half-long" is definitely unsuitable.

118. Trials of new vegetable varieties continued, and sixteen varieties proved superior to previous introductions. These included "Webb's Wonderful" lettuce, "Hundredweight" cabbage, "Money Maker" tomato and "Louisiana Green Velvet" okra.

119. *Extension Work*.—Agricultural Instructors in the section continued to work in close co-ordination with local market gardeners and fruit growers, and encouraged school gardening whenever conditions were suitable. This work featured advice on methods of cultivation, the use of fertilisers, pest control and irrigation problems. For the major part of the year, an itinerant instructor travelled the Provinces.

120. *Terracing Scheme*.—The second year of the scheme proved very successful. Increasing numbers of applications for assistance were received and progress was generally better than in 1955. This practical encouragement of anti-erosion work has resulted in more vegetables being available in Freetown markets during the rainy season.

121. *Horticultural Show*.—The fifth Annual Horticultural Show was sponsored by the Produce Marketing Board, and held at the British Council on the 8th May. The show was opened by Dr. M. A. S. Margai, M.B.E., and was well patronised by both local producers of fruit and vegetables and the general public. The entries were of good quality and variety, and school exhibits were again well to the fore.

122. *Technical Propaganda*.—The Horticulturist and his staff again gave lectures and demonstrations to various interested groups and organisations, including schools. A number of films on agricultural subjects were shown with the co-operation of the Public Relations Officer and the series of broadcast talks was continued.

D—EXTENSION WORK

SOUTH-WESTERN CIRCLE (PUJEHUN-BO-MOYAMBA)

123. *Inland Swamp Development*.—In both Pujehun and Moyamba Districts there was a noteworthy increase in acreage, although in Bo there was a slight decrease, as illustrated in the following table:—

District			Acreages						
			1950	1951	1952	1953	1954	1955	1956
Pujehun	..	..	2,677	2,677	985	1,235	1,597	2,347	2,455
Bo	..	..	1,455	1,544	2,624	2,836	4,912	4,701	3,882
Moyamba	..	..	—	921	1,276	1,170	1,720	756	3,605
Total	..	..	4,132	5,142	4,885	5,241	8,229	7,804	9,942

Of even greater interest is the fact that in all three districts there was an increase in the number of farmers, indicating a preference for smaller but higher yielding acreages in the swamps rather than on the uplands.

124. *Mangrove Clearance Scheme*.—Except for Bumpe and Ribbi Chiefdoms there has been a sharp drop in the acreage farmed in Moyamba District; no new developments occurred.

125. *Mechanical Cultivation*.—This was still confined to Pujehun District, and with the opening of a new site, five chiefdoms were served:—

Site	1951	1952	1953	1954	1955	1956
Gbundapi	32	403	321	256	303	559
Njalunda	—	—	107	198	210.5	229
Panga Krim	—	—	—	24	17	2
Saama	—	—	170	130	—	—
Sulima	—	—	25	403	617.5	458
Malen	—	—	—	—	—	216
Total	32	403	623	1,011	1,148	1,484

126. The year also saw the formation of a Co-operative Society at Gbundapi owning two Ferguson tractors, which were used to follow departmental ploughing, for harrowing and harrowing-in of seed. The slowness of ploughing fee repayments continued to be the main cause limiting acreage expansion.

127. Only limited sales of seed rice were made by Bo District Council from their nurseries and in Moyamba District most farmers had retained their own supplies.

128. *Cacao*.—An increasing number of seedlings of local strains were distributed from District Council nurseries, and quality—as a result of intensive propaganda—has continued to improve. Pujehun District Council has extended its Coffee-Cocoa Loan Scheme and a further seventeen farmers obtained loans worth £615.

129. *Amazonian Cacao Introductions*.—In the block planted at Futa, 115 trees of three types have survived and fruiting has begun.

130. *Coffee*.—The demand for seedlings continues to be in excess of supply, and plantings are being considerably expanded; 15,079 seedlings were distributed from District Council nurseries and a further 22,700 from Njala. Quality also has improved and local farmers are showing an interest in the purchase of their own hullers.

131. *Piassava*.—Production has fluctuated downwards reflecting price changes; but advice continues to be given by extension staff on the best methods of preparation.

132. *Oil Palms*.—There has been a marked decrease both in the demand for seedlings and in the numbers distributed from nurseries (57,758) due to the loss of interest in this crop compared to coffee, and to the District Councils being unable to provide transport for seedling distribution.

133. *Masanki Oil Palm Plantation*.—Replanting of the old plantation for the Produce Marketing Board continues; a total of 12,913 seedlings were planted out in the second half of Block IV; losses from rodent attack were, however, heavy. The felling of Block I has continued, and the nursery has been expanded to take 29,000 seedlings; a further 3,000 E.W.S. seedlings *ex* Njala were nursed on trays.

134. *Cattle Fattening Scheme*.—It is most unfortunate that neither the Moyamba nor Pujehun District Councils were able to continue their schemes because of lack of finance, particularly as they had shown such promising beginnings.

135. *Ginger*.—The acreage has dropped steadily over the last five years because of low prices; generally little interest is being taken in this crop.

NORTH-WEST CIRCLE (PORT LOKO-SCARCIES)

136. *General*.—Reference has already been made to the amalgamation of the Port Loko and Scarcies Circles under the Agricultural Officer, Port Loko. The establishment of the mechanical sub-station at Katonga on the Little Scarcies has also been continued by the completion of the workshop, one Junior Service Quarter and a rest house.

137. The major emphasis of extension work in this area has inevitably been concerned with rice, but additionally trials have been in progress to determine whether the large areas of *Lophira* bush can be utilised for agriculture.

138. *Mechanical Cultivation*.—The acreage ploughed in 1956 was double that of 1955, 1,303 acres being ploughed and harrowed, 549 rotary cultivated, 123 polydiscs and 33 ploughed. The increases over the last five years since work started being:—

1952	1953	1954	1955	1956
645	683	757	1,001	2,008

165½ acres were also combine drilled for farmers, who are showing an increasing interest in this further extension of mechanisation. Yields are likely to be very reasonable, except where flooding was too shallow and sun scorch effects were deleterious; estimates are 15–20 bushels per acre.

139. Co-operative marketing societies have been formed on most sites, and marketing difficulties should be reduced therefore. On many sites a fundi crop (*Digitaria exilis*) was taken first, followed by transplanted rice (variety—Lead).

140. On the Kasanko-Mankara site, where because of soil variations and previous crop failures, the area has been cultivated, drilled and fertilised before being allocated as a standing crop to farmers, results have now been sufficiently encouraging for the farmers to request the normal method of land allocation before planting to be reinstituted.

141. *Development of Lophira Bush*.—Earlier trials having shown that groundnuts are not a satisfactory crop for these soils, it was decided to plant up the 53 acres at Malal with oil palms. Survival has, however been very poor owing to the rapid growth of *Pennisetum subangustum* which also affords good cover for “cutting grass”.

142. *Oil Palms*.—Near Katonga, also on *Lophira* bush land, 200 supplies had to be made to the small plantation started in 1954; distribution to farmers from District Council nurseries was hampered by transport difficulties, but totalled 13,923. Survivals from previous plantings are estimated to be some 65 per cent.

143. *Piggery*.—Thirty-two pigs worth £380 were sold from the District Council piggery at Rosint, which continues to do well; a ready market for meat exists in Port Loko, Mahera and Lunsar. Losses totalled 4 and the head of stock increased to 42.

144. *Mangrove Clearance*.—At Rowal some new, unassisted, felling has been undertaken, but only some 42 acres were planted and many farmers continue to leave their land untouched, devoting their time to fishing. At Yeliba, fishing has also been more popular and little interest is being shown in rice. In the Gbabai Creek area, however, unassisted felling has continued and there are some 1,500 acres under cultivation, with no diminution in the interest and enthusiasm of those concerned with rice cultivation.

145. *Saline Swamps*.—At Bakepet, probably because less assistance was available from District Council funds for cleaning the drains, the area farmed has fallen. At Mapotolon, however, a group of thirty-five farmers joined in a Co-operative with the laudable aim of maintaining the bunds and sluices themselves.

SOUTH-EASTERN CIRCLE (KENEMA-KAILAHUN-KONO)

146. *General*.—Six of the nine graded Agricultural Instructors were assigned to the three District Councils, two being also temporarily transferred to other circles during the ploughing season. One, thereafter, assisted the Plant Pathologist in his Cocoa Black Pod spraying trials. Their duties were largely confined to general extension work on oil palm establishment, cocoa and coffee preparation, a census of farms, and to the expansion of swamp rice cultivation. The Kenema District Council farm was maintained mainly as an oil palm nursery and rice seed farm.

147. *Rice*.—Although no mechanical cultivation schemes comparable to the other circles exist in this area, increased swamp cultivation is being successfully encouraged. Resulting from the increased yields on demonstration plots laid down on District Council farms, nearly 13 tons of superphosphate fertilisers were bought by farmers.

148. *Cacao*.—Little increase in acreage has occurred, farmers devoting their main interest to coffee, because of the better price, less trouble from pests and diseases and earlier maturity. The crop was an early one and showed a slight increase to 2,210 tons. Fermenting trials and propaganda have all aimed at preventing over-fermenting, of which overseas buyers had tended to complain in the past, generally, however, quality has been very reasonable.

149. A number of sites were examined, before one near Puabu in Gaura Chieftdom was selected for the new Cocoa/Coffee Development farm to serve this important area.

150. *Coffee*.—Increased plantings continue on a considerable scale; propaganda has been directed to encourage the leaving of berries on the tree to mature fully before harvesting.

151. *Oil Palms*.—Seedlings distributed from District Council nurseries totalled 18,954, some 300 less than last year. Survival rates are extremely poor, being estimated at only 20 per cent after two years; here again transport and distribution problems are in part to blame.

152. The Kenema District Council farm plantation of Angolas which was laid down in 1948 has now been typed as follows:—

Macrocaria—8; Dura—40; Intermediate—11; Tenera—38;
Pisifera—3; Non-bearing—3; and Dead—1.

Bunch yields increased from 7,349 lb. to 9,606 lb. in 1956 from 100 trees.

153. The District Council plantations at Senahun and Worodu now total 163 and 35 acres respectively. At the former a high percentage of supplies had to be made, because of heavy grass growth and rodent damage. Owing to mechanical troubles the tractor had been unable to keep pace with weed growth in the early years, but despite further trouble this year, 75 acres were ploughed and harrowed and 45 acres goble discd.

SOUTHERN CIRCLE (BONTHE)

154. *Mangrove Swamp Reclamation*.—Loans issued under the clearing scheme which started in 1939, and was later taken over by the District Council in 1952, have now become finally due for repayment; of the 819

loans issued, representing £3,165 10s. 0d. all but £232 9s. 0d. has been repaid. When the District Council took over control of this scheme in 1952, it substituted a paid felling and clearing team for loan issues, recouping the costs by charging 2s. 6d. initially, and 7s. 6d. per acre annual rent thereafter. In the first two years 400 acres were felled, of which 305 have now been cleared; in 1954 the first year of allocation, 30 acres were allocated, with increases to 38 in 1955 and 95 in 1956; 65 of the latter are at Mandu, and the other 30 acres on Shenge Island.

155. *Mangrove Survey*.—Once again a survey was carried out towards the end of the year to assess the acreage of cleared mangrove areas under rice cultivation; excluding the 95 acres being utilised under the District Council Scheme, 1,537 acres or 71.5 per cent of the felled areas were in cultivation. Generally, the percentage tends to be higher where little upland is available and *vice versa*. Yields were estimated to be about 1,800 lb. of husk rice per acre, with *Paspalum vaginatum* showing up in some places as a serious weed.

156. *Rice Variety Trials*.—Despite flood damage troubles in the two previous years, variety trials were repeated on Shenge Island with nine new types from Rokupr. H.M.C. 19, Elon Elon and C. 24-102 showed up best with yields of 2,000 lb. per acre or better. The full results were:—

Variety	Yield per Acre (lbs)			Height of Rice at Harvest 1956 (ins.)
	1954	1955	1956	
C24/102	3,067	1,581	2,000	49
H.M.C. 19	2,960	563	2,628	50
Ebandioul	2,890	1,276	1,286	57
Siam 9	3,468	1,060	1,200	69
HR 1	1,183	2,250	1,746	49
Radin China	3,125	1,473	1,696	59
Reyon 6	1,930	1,024	1,666	51
Raminad	1,411	784	1,800	54
Elon Elon	1,874	2,721	3,000	69

157. *Mechanical Cultivation*.—The ploughed area in this Circle was again increased by nearly 1,500 acres to 5,530 distributed amongst 1,603 farmers; the ploughing sites ranged from Kiban on the lower Sewa to Torma, and up to Diamani on the Waanje, a spread of over 50 riverain miles. Twenty tractors were in action comprising:—

1 Fowler VF, 9 Fowler VFA and 11 Fordson Major County fitted with Perkins P6 diesel engines. For the initial clearing and final harrowing 16 Massey-Harris goble discs were used, and 15 Ransome Dragoons and 7 Massey-Harris 504's for the ploughing.

158. The clearing work began later than usual on the 17th January at Batahol II, and ploughing at Massa I on the 30th; by the end of March all ploughing was complete as well as 2,000 acres harrowed. All work was finished before the end of April.

159. Two light tractors owned by the Torma and Yawbeko Co-operative Societies were introduced this season to undertake harrowing for their own members.

160. Yields varied owing to the fact that the August rainfall was below normal and the high bank areas suffered; on the other hand the lower lying areas were not flooded excessively and gave good yields, estimated at 1,500 lb. per acre.

161. Both the mechanical sub-stations at Torma and Solon were further enlarged and the garage and storage facilities were improved. The new landing craft was delivered in November and is likely to prove invaluable in improving tractor and equipment transfers in this predominantly aquatic area.

162. *Piassava*.—The long-term rotational cutting experiment near Solon was continued for a fifth year; a reduction in yield when the plot is cut too frequently is already becoming evident.

163. Storage trials appear to indicate that mature piassava does not show any obvious falling off in quality, even when boiled and treated with caustic soda in its preparation. Further trials are in progress with regard to finding quicker methods of preparation which do not affect quality; as yet, however, it would be premature to advocate any change in methods, although many farmers have already adopted the quicker boiling methods for themselves.

164. *Oil Palms*.—The District Council plantation at Gambia was maintained but seedling distribution to farmers totalled only 400.

165. *District Council*.—An Agricultural Superintendent and two Agricultural Instructors were again assigned to Bonthe District Council; they were concerned with ploughing fee collection, the allocation of ploughland, crop damage assessment and the supervision of the mangrove clearing team.

NORTHERN CIRCLE (BOMBALI-TONKOLILI)

166. *General*.—Work within the (Makeni) Circle continued to be directed towards the application of advisory and extension services to farmers, with emphasis also on the development of mechanised rice cultivation on the boli lands. The agricultural activities of Tonkolili and Bombali District Councils, with which the Department is also closely concerned, were unfortunately restricted for financial reasons.

167. *Inland Swamp Cultivation*.—Earlier schemes instituted prior to 1953 by the Department and the Native Administrations to assist with inland swamp clearance have been succeeded by District Council Bonus Schemes, with payments being made to farmers on completion. A sliding scale is used from £2-£6 per acre, and the acreages cleared have been:—

Year			Acreage cleared	Average cost per acre		
				£	s.	d.
1954	..	..	236	2	5	0
1955	..	..	179	3	11	0
1956	..	..	132	3	18	6

These figures show that development is now having to be switched to the less accessible and less easily cleared swamps.

168. *Ox Ploughing*.—The Mabole Valley Ox Ploughing Scheme previously handed over to Bombali District Council, once again reverted to the Department for supervision. Despite difficulties, particularly from a shortage of spare parts, many farmers continue to operate; some, however, are now devoting more time to trade to the detriment of their farming.

169. *Mechanical Cultivation*.—Preliminary surveys have indicated that some 80,000 acres of boli land are available for mechanical cultivation. The development of these areas is proposed in two stages, the first being the gradual opening up of new sites by the Department, to be followed by the second, their handing over when established to Rice Producer Co-operatives.

The first of the latter has been established at Masimo in Tonkolili District, where for the first year the Society's own Ferguson tractors were used for harrowing 489 acres, plus 224½ acres after sowing. At the end of the year this site, totalling 1,200 acres, complete with buildings, was handed over to the Co-operative.

170. Meanwhile, further surveys have been undertaken in Malal, Bombali Sebor and Makari Gbanti Chiefdoms to select new boli lands to be opened up as replacement areas by the Department.

171. Expansion in the Batkanu-Mateboi area of Bombali District was impossible because of the chiefdom disturbances and the consequent difficulties of collecting ploughing fees; staff and equipment were therefore withdrawn when only 192 acres had been ploughed.

172. Investigations are continuing into fertiliser requirements and flooding on the boli lands, so that cultivation techniques may be improved.

173. The following table shows the development of mechanical cultivation in this area since its inspection:—

Additionally 575½ acres were harrowed

Site	Acreage ploughed				
	1952	1953	1954	1955	1956
BOMBALI DISTRICT:					
Bantoro (Sanda Tenraran)	238	417	435	375.5	—
Rochain	—	190	301	336	54
Malama	—	—	101	129	—
Mangara	—	—	167	221	—
Rogaret	—	—	209	—	—
Rolemre	—	—	—	108.5	—
Fankma	—	—	—	175	—
Mabenji (Pendembu Gowahun) ..	—	—	—	378	—
Private Farmers	—	—	9	30	—
Kondombahun	—	—	—	—	138
Total	238	607	1,600	1,373	192
TONKOLILI DISTRICT:					
Masimo (Kholifa Mabang)	—	308	294	1,215.5	1,084
Rochen (Malal Mara)	—	—	310	608.25	330.5
Rogbinke (Mamunta Mayoso) ..	—	—	—	404	336.5
Masugbe (Malal Mara)	—	—	245	—	—
Kumrabai (Kholifa Mabang) ..	—	—	—	—	280.5
Masang	—	—	—	—	146
Maconi (Mamunta Mayoso) ..	—	—	—	—	42
Mabobo	—	—	—	—	62.5
Kontobe (Malal Mara)	—	—	—	—	345.5
Total	—	308	849	2,227.75	2,627.5
Grand Total	238	915	2,449	3,600.75	2,819.5

174. Sales of superphosphate fertilisers rose from 112 to 140 tons or an average of 1 cwt. per acre ploughed; as 2 cwt. per acre is the rate recommended by the Department it is obvious that the value of fertiliser is becoming more and more appreciated by farmers.

175. With the mechanical sub-stations at Batkanu and Masimo completed, building work at the new centre at Kontobe has been commenced.

176. *Oil Palms and Coffee.*—The District Councils distribution of oil palm seedlings, assisted by the Department, fell to 27,195 from 31,216 in the previous year; 36,887 coffee seedlings were also supplied to farmers.

NORTH-EASTERN CIRCLE (KOIDADUGU)

177. *Cattle Owner Settlement Scheme*.—Although routine general extension work is also carried out in this Circle, the most important activity in progress is the Cattle Owner Settlement Scheme which was begun in 1953 in co-operation with the Koinadugu District Council. The objective of the scheme is to settle the nomadic cattle owners in blocks 1 square mile in size, and thereby to control over-stocking, erosion and farm damage; also secondarily to encourage crop cultivation by the cattle owners themselves.

178. Various facilities are provided for the cattle owners who take up surveyed holdings including, where desired, small dams which are designed both to improve dry season grazing and to allow crop cultivation. *Pueraria phaseoloides* strips are sown where practicable in grazing areas, and coffee, oil palm, citrus and coconut seedlings made available. Anti-tick spraying with Gammatox has also proved popular, and a hyaena poisoning campaign, carried out with the co-operation of the Veterinary Department, resulted in at least twenty being killed.

179. During 1956 the number of settlements was increased in Sulima Chiefdom near to Gberia Timbako, and many of the old settlements were realigned and several replaced. By June the Tribal Authority was asked to register all settlements in the area; this they did with the exception of six areas, so that twenty-eight out of thirty-four were actually registered, the other six being expunged. At the year's end twenty-nine agreements were in being and thirteen holdings were ready for settlement in the following year.

180. Additionally, a rest house and store, two tractor sheds, and a loading ramp were constructed at Gberia from funds contributed by the District Council; the tractor road to Koba was improved using a Ferguson scraper blade, 4 miles of new road were opened up from Dala Musaia towards Biribaia to give access to settlements and with a view to future expansion towards Gberia Fotombu, and a similar distance of new road was opened to give access to settlements in the Gberia Timbako area.

181. Ploughing was carried out at Mongu Bendugu, Mombile, Gberia Timbako, Falaba and Musaia, and many other requests had to be refused because time and equipment did not allow further work to be undertaken.

182. The District Council nurseries supplied oil palm and coffee seedlings to farmers in all areas.

COLONY CIRCLE (NEWTON)

183. *Rice Swamp Development*.—Once again a small increase in the amount of land taken up in the Maswari empolder can be recorded, but with ploughing fee charges increased to the same rates as in other areas, the amount of land ploughed fell by half to 25 acres only. Crop yields were generally satisfactory averaging 1,450 lb. to the acre.

184. Little work was done at either Kotopema or Campbell Town where of the total 97 acres available, only 4 and 21 acres respectively were planted; this was very disappointing after all the work and propaganda which had been put into these schemes, and is probably largely due to the shortage of young men left in the area; even a reduction of the rents by the Rural Area Council failed to help.

185. Slow progress continues in the Songo Creek mangrove clearing loans scheme, mostly by clearing of trash, and only some 20 acres were actually planted up.

186. The whole of the Wellington empolder was cultivated for the first time this year with very satisfactory yields; it is apparent that the original cause of the toxicity here, which resulted in complete crop failure, has, with time, now completely disappeared.

187. *Coffee*.—Double the previous quantity of seedlings, 15,530 were distributed from the Department's nursery at Newton during the year.

188. *Waterloo Oil Palm Plantation*.—Fire, particularly from the railway, continues to be a serious hazard, but has been reduced by brushing and inter-cropping with cassava and rice parallel to the main line. Rodent damage has been controlled almost completely by the use of wire protecting collars around transplanted seedlings.

189. Tree counts and compass surveys carried out during the year confirm that a total of 602 acres have been planted since 1950, including 165 acres this year.

190. Routine brushing continued but attempts to mechanise it to reduce labour costs were frustrated by the damage caused by stumps to the "Baronet" harrow and the tractor.

191. The second year's harvest yielded 4,831 lb. fruit from which 42 gallons palm oil and 27 bushels of kernels were obtained.

192. *Oil Palm Distribution*.—Only 6,566 seedlings were distributed to farmers, less than half that of previous years; this was due to the new policy of supplying plants only to those who had the ground properly prepared. Additionally, 12,000 plants were used on the plantation itself and at Newton farm.

193. As in previous years local farmers were encouraged to take up land rent free for inter-cropping on the plantation and some 60 acres were so cultivated, with a further 25 under stock feed for Newton farm.

194. *Local Stock Keeping*.—Keen interest has continued in the production of pork, which, by the end of the year, had proved for the first time to be in quantity sufficient for the Cold Storage Company in Freetown to cease importations. Less success was achieved with poultry and farmers unfortunately still prefer to buy adult stock, rather than be prepared to finish off rearing from six weeks old themselves.

E—RESEARCH

PLANT PATHOLOGY SECTION

195. The Plant Pathologist, who was in Sierra Leone throughout the year reports as follows:—"Duplicates of mycological collections were sent to the Commonwealth Mycological Institute and the Kew Herbarium; these included a number of minor new records for Sierra Leone.

196. In the absence of the Systematic Botanist and Ecologist, the phanerogamic herbarium was again supervised by the Plant Pathologist. Over 200 collections were made during the year, duplicates being sent to the Royal Botanic Gardens, Kew.

197. A number of cocoa farms in the Kenema District were visited to assess the incidence of "Black Pod" disease (*Phytophthora palmivora* Butler); farms in Gaura and Tunkia Chiefdoms were more heavily infected than elsewhere, the highest incidence being reported from Taninahun, where on one farm 70 per cent of the trees averaged four diseased pods each.

198. Farmers were advised to remove and bury diseased pods as an immediate control measure, and experiments were begun at Puabu in Gaura Chiefdom to estimate the value of sprays and sanitation in checking the disease. The treatments were:—

- (i) underbrushing and 1.0 per cent Carbide Bordeaux applied to developing pods at 1, 2, 3 and 4-week intervals;
- (ii) underbrushing and 0.4 per cent Perepod applied at fortnightly intervals;
- (iii) underbrushing and 1.0 per cent Carbide Bordeaux applied at fortnightly intervals;
- (iv) underbrushing alone;
- (v) control.

199. Although the results were not statistically significant, largely because of the considerable tree variation, the indications were that any treatment is better than no treatment, and the experiment will be repeated on selected, high yielding trees in 1957.

200. *Cocoa Seedling Wilt*.—This disease, not previously recorded from Sierra Leone, was observed on seedlings of Ghana varieties T60/F3, T72/F3 and T76/F3; variety T72/F3 appeared to be most susceptible to the disease, 50 per cent of the seedlings dying within three weeks of germination. The symptoms of the disease were a peculiar ridging and twisting of the stem, with necrotic areas at the apex and margin of the leaves. The epidermis of the tap root became coloured from pale brown to pitch black, and was followed by decay of cortical tissue. No pathogen was identified, either locally or by the Mycological Institute, but it is likely that the infection originated in the soil, because when the seedlings were transplanted into soil treated with 1 per cent formalin an improvement in condition was noticeable.

201. *Citrus Scab* (*Sphaceloma fawcettei* Jenkins) was again identified on grapefruit at Njala and in surrounding villages, infected material being cut and burned.

202. *Bananas*.—The leaf spot on bananas in the Port Loko and Kambia districts referred to in last year's report proved to be due to *Scolecotrichum musae* Zimm., a disease of no economic importance, but the conidial stage *Cercospora musae* Zimm. of the fungus *Mycosphaerella musicola* Leach was identified for the first time at Mokonde, near Njala.

203. A "wet rot" of the stalks of oil palm fruit bunches was recorded on oil palms at Njala Training College; the fruits were killed before maturity. The organisms *Botryodiplodia theobromae* Pat. and *Nectrica ochroleuca* (Schw.) Berk were identified."

SYSTEMATIC BOTANY SECTION

204. No Botanist was in post during the year; the Plant Pathologist maintained general supervision of the herbarium.

205. *Raphia* palm collections sent to Kew in 1955 showed that some of the scientific names formerly used were incorrect: "Nduvui" is *R. Hookeri* (not *R. Vinifera*), and "Kelei" is *R. gracilis*. These are the main sources of supply of piassava; the Northern species is *R. Sudanica*.

ENTOMOLOGY SECTION

206. The post of Entomologist remained vacant during the year. The rehabilitation of the departmental collection of specimens which was in danger of becoming irreparably damaged through neglect was, however, carried out in a most workmanlike fashion by Mrs. F. J. Jordan.

207. A severe outbreak of coconut beetle (*Oryctes owariensis*) was observed at Goderich during the early part of the year. Measures taken by the Department to rid the area of this destructive insect included spraying with 2 per cent Agrocide, baiting the growing points with an Agrocide-sawdust poison bait, and the felling and burning of infected trees and trash.

208. It was later found that a species of *Rynchophorus* (Red Palm Weevil) was associated with the *Oryctes* beetle, and it is probable that *Rynchophorus* is the more destructive of the two pests. At present, the felling and burning of infected trees appears to be the only reliable method of controlling this insect, although trials with other insecticides are proposed.

209. For the first time since 1944 a small swarm of locusts was reported but the invasion lasted only a few days, before the swarm moved back into French Guinea.

AGRICULTURAL CHEMISTRY SECTION

210. The Agricultural Chemist proceeded on leave at the end of July and resumed duty at the end of the year.

211. *Laboratory Investigations.*—Over 1,500 plant samples were analysed between May and August for phosphorus, potassium, calcium and magnesium, and the data on the rate of uptake and requirements of these nutrients by Kono groundnuts is now being examined. Unfortunately, responses in the major fertiliser experiment were less than in 1955 so that the difference in nutrient content between treatments was not marked.

212. A few analyses were made on local stock feeds and a start made in the production of a table of their nutritive value.

213. *Pot Experiments.*—Experiments using the Webb technique as reported in 1955 continued, and it was confirmed that deficiencies of nitrogen, phosphorus, calcium and magnesium were widespread in both swamp and upland soils. It is hoped that routine diagnoses of plant nutrient deficiencies in soil will be started in 1957. A glass house for this work arrived late in the year, but a specially designed ion exchange water demineralisation plant is still awaited.

214. *Field Experiments with Nitrogenous Fertiliser on Upland Rice.*—

In view of the known nitrogen deficiency in Njala soil, as shown by pot experiments and observations on upland rice, and in spite of previous failures of nitrogenous fertilisers to improve yields, an experiment was laid down to test the response of upland rice to sulphate of ammonia. In a four by four layout, replicated six times, four levels of sulphate of ammonia were applied at two different times, at planting and as a top dressing. All plots were dressed with 2 cwt. per acre of superphosphate. Upland rice was broadcast on 23rd April, after harrowing in the first application of sulphate of ammonia. By early June marked plot differences were noticeable, but these bore no relation to fertiliser treatments. Top dressing was carried out on 3rd July. Growth continued uneven and irrational, and the experiment was abandoned and ploughed up in early August. Thus the problem of the local nitrogen nutrition of upland crops remains unsolved.

215. *Field Experiment with Fertiliser on Groundnuts, Njala.*—An experiment, based on previous work, was designed to determine the optimum levels of phosphorus, potassium, calcium and magnesium for groundnuts. In view of the fact that this previous work had shown a pronounced inter-

action between calcium and magnesium on this crop, dolomitic limestone was used as the cheapest available source of these elements. Full details of the experiment are given in Appendix III. There were no significant differences in treatment, but there was a significant interaction between limestone and superphosphate, although its relations to treatment levels was obscure. The fertiliser had little effect on shelling percentage, kernels per fruit, or the number of "blind" fruits. Limestone significantly increased the total number of kernels produced, but the treatment was not economic. Although soil, climatic and cropping conditions were similar to those of 1955, yields were considerably greater than in the previous year. No zero level treatments of superphosphate or sulphate of potash were included in the experiment, as the response had been clear-cut in previous trials, and it was necessary to keep the experiment to a manageable size. This was perhaps unfortunate as the conclusion can be drawn from the 1956 figures that the lower levels of these fertilisers are as effective as the higher. Planting was done about a month earlier than in previous years, that is, in mid-April, which is known to give the highest yields as a rule. This practice cannot, unfortunately, be adopted by the small farmer, as the crop matures and must be harvested and dried in the middle of the heavy rains.

216. *Lophira Bush*.—No experiments were carried out, but a preliminary survey to determine the area under this vegetation was made from aerial photographs and ground observations. It was found that this particular type of savannah woodland tends to follow watersheds and that the area is not so large as was formerly thought; because roads also follow the watershed, an erroneous impression has been created that much of the country is covered by *Lophira*; nevertheless, the area is sufficient to warrant further investigations.

217. *Estimation of Rice Yields*.—A large number of samples were collected as in 1955, but the problem of personal bias rendered results inconclusive.

F—NJALA TRAINING COLLEGE

218. *Agricultural Courses*.—The system whereby students undergo one year of pre-entry field training under the supervision of Agricultural Officers continued. Twenty-two students completed their field training in 1955, and of these, fifteen were accepted for admission to the College in February, 1956. This figure includes two students being trained on behalf of the West African Institute for Oil Palm Research. In addition, two places were allotted to students from the Gambia, so that, in all, seventeen students began their first-year studies. One first-year student resigned during the year.

219. There were sixteen students in their second year, and nine completed their final year in July. The latter were posted to Agricultural Officers for six months practical work before being appointed as Agricultural Instructors, Grade III on probation in January, 1957. This group of nine is the last to follow the earlier scheme, when practical work was undertaken after the academic course.

220. As in previous years, courses continued according to the revised syllabus, with the usual interchange of Education and Agriculture staff. Emphasis was laid on practical subjects allied to the requirements of the Department of Agriculture; surveying and farm implements and machinery were given particular attention.

221. Practical work continued at the College Farm on well established lines. The area under contour strips was extended, one strip being cleared and stumped for annual crops, and another planted with citrus trees. In addition, the students carried out practical exercises on the departmental farm, Njala.

222. The livestock section was maintained, and as in the past, the piggery was able to provide a hog every month for the students' mess. This not only augments the students' diet, but is an important object lesson to both Agriculture and Education students. The cattle which died in 1955 were replaced. One calf was born and at the end of the year both the cow and heifer were in calf. Small stock—rabbits, guinea pigs and poultry, did well on a small scale.

223. The machinery section was expanded by the acquisition of a palm nut cracking machine, and a gang mower. The latter proved particularly useful in reducing the cost of upkeep of the playing fields and compound.

224. Through the generosity of manufacturers of agricultural machinery and materials, a comprehensive collection of visual aids was made for the College. Messrs. Fowlers of Leeds presented a full size cut-away model of their Mark V.F. tractor. Other firms provided wall charts, film strips, samples of their products and liberal quantities of literature. Thanks are due to the many organisations who have helped in providing these materials.

225. Visits were again paid by students to various departmental stations to study at first hand many of the aspects of departmental activity; Rokupr, Makeni and Musaia were among the places visited.

APPENDIX I—EXPORTS OF PRINCIPAL AGRICULTURAL PRODUCTS

Commodity	1938				1953				1954				1955				1956			
	Tons	Value £	Price £	Tons	Value £	Price £	Tons	Value £	Tons	Value £	Price £	Tons	Value £	Price £	Tons	Value £	Price £	Tons	Value £	Price £
Bananas	1	2	—	528	11,410	21	662	16,169	24	292	7,624	26	16	333	21					
Beeswax	—	—	—	8	3,026	378	20	8,392	420	19	8,889	468	11	6,074	528					
Benniseed	374	3,700	10	636	45,666	71	198	17,561	89	111	8,848	79	12	761	63					
Calabar Beans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—					
Cacao	384	5,849	15	1,631	452,923	270	1,738	802,565	462	2,177	740,829	340	125	31,797	254					
Coconuts (fresh)	n.a.	44	—	n.a.	—	—	104	2,445	23	25	680	27	24	581,305	201					
Coffee	38	793	21	1,050	333,014	317	2,393	862,892	373	2,092	473,983	226	3,009	660,875	219					
Ginger	2,705	60,680	22	1,859	144,702	77	1,143	162,206	141	1,733	357,320	206	1,117	241,269	216					
Groundnuts	n.a.	5	—	2,686	153,000	56	1,142	64,288	56	—	—	2	—	2	—					
Kola Nuts	1,450	29,785	20	1,205	136,385	113	1,379	275,545	200	1,127	212,095	188	828	106,840	129					
Palm Kernels	63,697	457,031	7	68,904	4,259,539	61	68,080	3,763,924	55	57,640	2,509,537	43	57,645	2,507,839	43					
Peanut Oil	1,006	16,025	15	362	26,873	74	919	53,667	58	15	2,252	150	13	1,464	113					
Pepper (Dried Red)	90	3,410	38	24	3,677	153	4	941	235	14	2,653	190	2	324	160					
Piassava (Prime Sherbro)	3,751	40,369	10	2,646	192,452	72	5,693	334,210	59	4,344	215,179	49	611	47,284	77					
Piassava (Sulima)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—					
Total Value all Exports		617,693			5,765,173			6,364,805			4,588,223			4,449,341						
Total Tonnage all Exports	73,556			81,539			83,475			70,218			70,927							

APPENDIX II—RAINFALL

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Total	Average
Musaia	Nil	1.56	1.25	3.95	3.98	13.96	10.44	12.40	13.43	5.26	3.87	1.42	71.52	82.24
Makeni	Nil	1.47	N.R.	N.R.	N.R.	9.81	17.88	20.93	22.30	12.74	5.63	2.28	107.88	119.70
Kontobi	Nil	N.R.	N.R.	N.R.	10.14	12.96	15.71	12.49	16.35	13.02	9.15	3.05	—	—
Batkanu	Nil	0.32	1.03	1.25	5.67	13.91	17.26	16.44	21.33	14.55	3.63	0.41	95.80	107.88
Port Loko	Nil	0.04	1.51	5.51	4.19	6.70	19.27	15.83	20.02	16.32	7.67	2.99	100.41	111.75
Rokupr	Nil	0.23	0.24	4.93	8.89	23.57	22.91	25.23	20.82	14.29	5.04	2.78	126.16	116.58
Lungi	Nil	0.08	1.59	4.65	9.86	11.32	28.44	21.28	17.43	11.73	2.76	2.88	112.02	136.91
Newton	Nil	0.31	0.50	2.35	12.28	13.69	28.38	18.27	10.80	12.22	6.91	4.55	110.26	129.03
Waterloo	Nil	0.04	0.78	6.28	7.55	5.88	12.49	7.47	4.22	4.40	N.R.	1.81	Reading suspect	—
Hill Station	Nil	Nil	0.23	5.28	5.44	28.44	38.60	29.74	24.50	9.52	5.36	3.41	150.52	173.41
Lumley	Nil	Nil	N.R.	N.R.	N.R.	28.46	N.R.	N.R.	N.R.	N.R.	6.31	N.R.	—	—
Regent	Nil	0.03	0.27	5.08	N.R.	26.55	45.43	34.99	31.94	12.06	6.49	N.R.	—	—
Moyamba	Nil	1.48	2.09	8.36	15.34	12.20	17.46	N.R.	N.R.	N.R.	N.R.	N.R.	—	102.82
Masimo	N.R.	N.R.	2.62	6.98	11.44	14.72	11.62	16.05	21.37	15.18	7.55	5.27	—	—
Njala	Nil	1.19	3.05	3.97	10.67	15.63	19.63	13.78	22.20	10.81	7.94	4.24	113.1	1109.50
Bo	Tr.	1.32	3.21	4.88	6.15	16.64	17.45	16.11	20.08	10.28	8.48	4.13	109.03	115.84
Bonthe	0.46	0.61	2.08	7.38	11.94	23.31	27.67	11.70	18.51	11.12	5.04	4.41	124.28	158.80
Solon	Nil	0.43	1.78	3.20	9.76	32.79	32.19	17.50	30.96	10.46	7.47	6.75	153.29	—
Pujehun	N.R.	N.R.	5.15	4.99	5.75	13.40	16.49	14.81	23.00	N.R.	1.49	2.91	—	—
Sulima	Nil	5.19	14.93	12.92	7.91	N.R.	15.51	27.09	N.R.	N.R.	N.R.	N.R.	—	114.06
Kenema farm	0.43	1.96	5.06	3.86	6.95	9.51	19.69	12.49	12.74	14.88	N.R.	14.77	—	—
Kailahun	Nil	0.92	5.38	N.R.	6.20	N.R.	N.R.	19.20	N.R.	N.R.	N.R.	6.40	—	111.46
Yengema	Nil	4.86	3.87	3.70	5.74	13.45	10.49	6.75	14.79	10.68	N.R.	3.75	—	97.32

N.R.—No Record.

APPENDIX III

RESULTS OF TRIALS AND EXPERIMENTS

Leguminous Fodders and Green Manures.—*Pueraria phaseoloides* continues to provide a useful fodder for livestock throughout the year. *Stylosanthes gracilis* was again difficult to establish from cuttings, and seed collection proved expensive; yet once established it grows well and is of considerable value. *Crotalaria astragalina*, *C. striata* and *Cassia tora* were again grown for seed, being the most promising of the cover crops originally introduced from French Guinea.

Groundnuts (a)—*The Time of Planting Trial* was started in 1954 and has indicated that early planting gives the higher yields. This was again true this year, when the local Kono variety was planted at seven-day intervals from mid-March to the end of May. 2 cwt. each of superphosphate and sulphate of potash were applied to the 1 acre block, and planting was at 9 inches by 9 inches. There were four replications, and the results were as follows:—

				Date planted			Yield lb/acre undecorticated		
				1954	1955	1956	1954	1955	1956
March	..	..	..			12th			1,008
						19th			1,055
						26th			1,045
April	..	..	..		6th	3rd		578	755
				8th		9th	1,065		625
					15th	16th		422	480
				22nd	28th	23rd	865	540	563
May	..	..	..			3rd			540
				6th	10th	7th	535	218	445
						14th			348
				20th		22nd	350		288
					31st	28th		188	268
June	..	..	..	3rd			260		
				17th			5		
July	..	..	..	1st			Failed		

(b) *Exhaustion Trial.*—A groundnut crop has been taken each season since 1951 from the same block, without any fertiliser application, to study the effects of continuous cropping. The steady yield decrease has again been maintained in 1956:—

Year	Yield lb./acre (undecorticated)					
1951	..	..	..	..	..	974
1952	..	..	..	..	..	512
1953	..	..	..	..	..	711
1954	..	..	..	..	..	358
1955	..	..	..	..	..	289
1956	..	..	..	..	..	140

Yams.—The varietal experiment started in 1954 has been continued and once again demonstrated that White yams do not do well under Njala conditions.

The yields were:—

	1956 lb./acre	1955 lb./acre	1954 lb./acre
Yellow Yams ..	7,267	10,224	2,259
Water Yams ..	7,350	not grown	
White Yams ..	2,827	971	1,452

Continuous Cultivation of Annual Crops.—The mixed cropping trial, commenced in 1952, continued, and despite fertiliser applications, yields have again fallen except for the cassava, confirming the indications that fertility cannot be maintained.

Total yields since 1952, in (lb)

			<i>Husk Rice</i>	<i>Cassava</i>	<i>Yams</i>	<i>Musaia Cowpea</i>	<i>Men fed per year per acre</i>
1952	..	..	135 (Flagoi)	7,553	1,238	10	4.50
1953	..	..	120 "	5,033	3,346	—	3.96
1954	..	..	497 (Glaberima)	3,235	1,306	56	2.75
1955	..	..	483 "	2,826	81	6	2.77
1956	..	..	2.6 "	3,137	1,252	—	2.57

Permanent Crops.—The yield recording of Citrus, Coffee and pineapples continued; 1955–56 was generally a very poor year for citrus, after a very heavy yield in the previous year.

Oil Palms.—The block of Angola palms on "New" Njala farm were removed during the year, as this work is now being covered by the W.A.I.F.O.R. sub-station on "old Njala". 100,000 E.W.S. seed received from W.A.I.F.O.R. in September were set in the departmental germinator, and germinated seed distributed to nurseries in the various circles; additionally 2,360 seedlings were distributed from Njala. Germination percentages (1955–56) varied from 67 per cent (D x P), 61 per cent (D x D) to 40 per cent (T x D); the average of 56 per cent was a considerable improvement on the 38 per cent achieved in 1954–55; this was due to a change of method whereby seed was set in September in charcoal trays, and a temperature of 95° F and 100 per cent humidity was maintained.

Chemist's Groundnut Fertiliser Experiment (Paragraph 207).

Yield results (lb./acre of dried fruits) of this experiment are:—

<i>Treatments</i>				<i>Superphosphate in cwt./acre</i>			<i>Mean</i>
				1	2	4	
Sulphate of Potash in cwt./acre ..	..	1	1,476	1,659	1,728		1,621
	..	2	1,650	1,577	1,741		1,656
	..	4	1,678	1,612	—		—
Mean	..	..	..	1,601	1,616	1,736	1,651

No differences significant.

<i>Limestone in cwt./acre</i>				0	5	10	15	20
Yield	..	..	..	1,540	1,581	1,666	1,754	1,711

No differences significant.

There is a significant interaction (5 per cent level) between limestone and superphosphate, but its relationship to treatment levels is obscure.

The various fertilisers had little effect on shelling percentage, kernels per fruit or the degree of blindness. Limestone did increase the total number of kernels but this was not economic:

<i>Limestone cwt./acre</i>				0	5	10	15	20
Kernels/acre (thousands)	..	..	..	1,027	1,042	1,142	1,167	1,172

Significant difference—89.

APPENDIX IV

SIERRA LEONE WEIGHTS AND MEASURES

The sale of local produce in native markets is almost invariably done by volume. Standard containers which can be readily obtained are used, the commonest being the cigarette tin (cup) and the beer bottle. Larger measures are the four gallon kerosene tin, and the kerosene case, which held two tins. These are no longer readily available since fuel is now principally supplied in 44-gallon drums or in bulk.

Certain measures became standardised by usage for the major agricultural commodities. The average weight of kerosene case, heaped up until no more stayed on, was taken as the basis for the "bushel" weight. The Sierra Leone "bushel" is, therefore, considerably greater than the Imperial bushel. It does not even refer strictly to the older "Colonial" bushel used up to 1900, but to the weights of the lots in which commodities are traditionally traded.

The following tables contain most of the Sierra Leone measures.

Basic Measure of Volume.

4 cigarette cups	..	..	..	..	1 penny pan.
2 penny pans	..	..	..	..	1 threepence pan.
5 threepence pans	..	..	..	..	1 kettle (21lb. clean rice).
2 kettles	..	..	..	..	1 can or tin.
2 cans or tins	..	..	..	..	1 bushel (84 lb. clean rice)

Standard nett weights per bag.

Cocoa	..	..	..	..	140 lb.
Coffee	..	..	..	..	132 lb.
Ginger	..	..	..	..	212-235 lb.
Groundnuts (undecorticated)	..	..	..	..	77 lb.
Palm kernels	..	..	..	..	182½ lb.
Rice (clean)	..	..	..	..	168 lb.
Rice (paddy)	..	..	..	..	120 lb. (often 150 lb.)

"Bushel" weights.

Benniseed	..	..	..	..	60 lb.
Chillies (dried peppers)	..	..	..	..	28 lb.
Groundnuts (unshelled)	..	..	..	..	36 lb.
Guinea corn	..	..	..	..	84 lb.
Kola nuts ("measure"—8 kettles)	..	..	..	..	176 lb.
Maize	..	..	..	..	72 lb.
Palm kernels	..	..	..	..	60 lb.
Rice (clean)	..	..	..	..	84 lb.
Rice (paddy)	..	..	..	..	60 lb.
"Bundle" of piassava	..	..	..	..	56 lb.

Miscellaneous Measures.

Bottle—reputed quart	..	..	..	..	$\frac{1}{6}$ gallon.
Bottle—reputed pint	..	..	..	..	$\frac{1}{3}$ gallon.
Cigarette cup	..	..	..	..	8 to 9½ ozs. of rice.
Kettle (clean rice)	..	..	..	..	21 lbs. (2 gallons approx.)
Tin (or can)	..	..	..	..	4 gallons
Honey	..	..	..	..	48 lb.
Palm oil	..	..	..	..	38 lb.

*To be purchased from the Government Bookshop, Water Street, Freetown and
from the Crown Agents for Oversea Governments and Administrations
4 Millbank, Westminster, London, S.W. 1.*

